FBIC Integrated Solid Waste Management Plan

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EXECUTIVE SUMMARY

On the Fort Belknap Indian Reservation in Montana, solid waste collection and disposal is provided as a service to residents by the Fort Belknap Indian Community (FBIC) Tribal government. With rising operating costs, public health concerns, and evolving regulations, solid waste management is a serious concern of FBIC residents, Tribal officials, and government agencies.

Early solid waste practices on the Reservation had few restrictions, and included open dumping and burning. Improvements toward cleaner and safer disposal were implemented over time. In the 1990's, old dumpsites were closed and a system involving collection and hauling of solid waste to the Hill County landfill began. This system, although generally effective, has not always been economically viable, and a temporary suspension of landfill service resulted in large accumulations of waste and associated health and safety risks at the FBIC solid waste transfer sites.

In 2004, the FBIC Tribal government established Prairie Mountain Utilities, a self-sustaining entity of the Tribal Government with directives for managing solid waste, water, and wastewater on the Reservation. This was done in part to consolidate utilities invoicing and provide long-term economic stability for solid waste management.

The FBIC is currently under an administrative order from the U.S. Environmental Protection Agency to clean up waste accumulated at the container sites and implement a sustainable plan and schedule that will prevent the recurrence of open dumping and burning.

This integrated solid waste management plan includes recommended actions for the proper storage, collection, transportation, disposal, control, and minimization of solid waste generated by the FBIC. This solid waste management plan is intended to be an adaptive plan that will be looked at every three to five years, assessed against the current situation, and revised as needed to meet changing requirements and conditions.

The recommendations contained within this plan are directed toward cost-effective transfer and haul improvements to the existing system and viable waste minimization/recycling efforts that can be phased in over time. It is left to the FBIC Council to develop specific goals and action items (based on the recommendations of this plan) and implement a schedule fulfilling these needs within a reasonable time period.

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FBIC Integrated Solid Waste Management Plan

1.0 INTRODUCTION

On the Fort Belknap Indian Reservation in Montana, solid waste collection and disposal is provided as a service to residents by the Fort Belknap Indian Community (FBIC) Tribal government. With rising operating costs, public health concerns, and evolving regulations, solid waste management is a serious concern of FBIC residents, Tribal officials, and government agencies. This document is intended to provide a comprehensive integrated solid waste management plan, including recommended actions for the proper storage, collection, transportation, disposal, control, and minimization of solid waste generated by the FBIC. This solid waste management plan is intended to be an adaptive plan that will be looked at every three to five years, assessed against the current situation, and revised as needed to meet changing requirements and conditions.

1.1 Municipal Solid Waste Regulations

By means of resolution 72-92, the Fort Belknap Indian Community adopted a code authorizing, directing and regulating the planning, maintenance and operation of a comprehensive solid waste management program. This code, shown in Appendix A, is identified as the *Solid Waste Management Code of the Fort Belknap Indian Reservation.* The Fort Belknap Indian Community Council (FBICC) approved the code on March 27, 1992. This code does not conflict with the federal Resource Conservation and Recovery Act (RCRA) whose authority it is under. The Tribes, represented by the FBICC, are the only governmental entity within the boundaries of the Fort Belknap Indian Reservation that have the responsibility and authority to enforce the *Solid Waste Management Code of the Fort Belknap Indian Reservation*.

RCRA, 42 U.S.C. § 6901 et seq. (1976) creates a comprehensive federal regulatory program for the management of hazardous and solid waste. Part 257 and Part 258 of Title 40, Code of Federal Regulations (CFR), provide guidelines for the disposal of solid waste and construction and operation of solid waste facilities. The Director of an approved State solid waste program is typically responsible for implementation and enforcement of these regulations. Although the U.S. Environmental Protection Agency (EPA) can approve State solid waste programs, the Agency cannot approve Tribal solid waste programs. Solid waste regulations on Indian Lands (lands managed by federally recognized Tribal governments) are self-implementing but EPA can approve site-specific flexibility requests in lieu of a State Director.

While EPA cannot enforce the requirements of 40 CFR Parts 257 and 258 on Indian Lands, the Agency does have enforcement authority under Section 7003 of RCRA. Enforcement actions could be taken if a solid waste practice poses an imminent and substantial endangerment to human health and the environment. The Resource Conservation and Recovery Act, Section 6972(a), also authorizes citizen suits. The citizen suit provides for "any person" to bring a civil suit to enforce the provisions of RCRA. A citizen filing a suit against an alleged violation on a Reservation may be a member of the Tribe or a citizen from the surrounding community. The court may assess penalties.

1.2 Solid Waste Management Plan Summary

This solid waste management plan is organized to include the following sections:

1. Introduction
2. Reservation Description and Background
3. Solid Waste Management Practices
4. Solid Waste Management Alternatives
5. Waste Minimization and Education Programs
6. Goals and Recommendations
7. Plan Implementation, Funding, and Approval
8. References

2.0 RESERVATION DESCRIPTION AND BACKGROUND

This section describes the Fort Belknap Indian Reservation's physical setting and history.

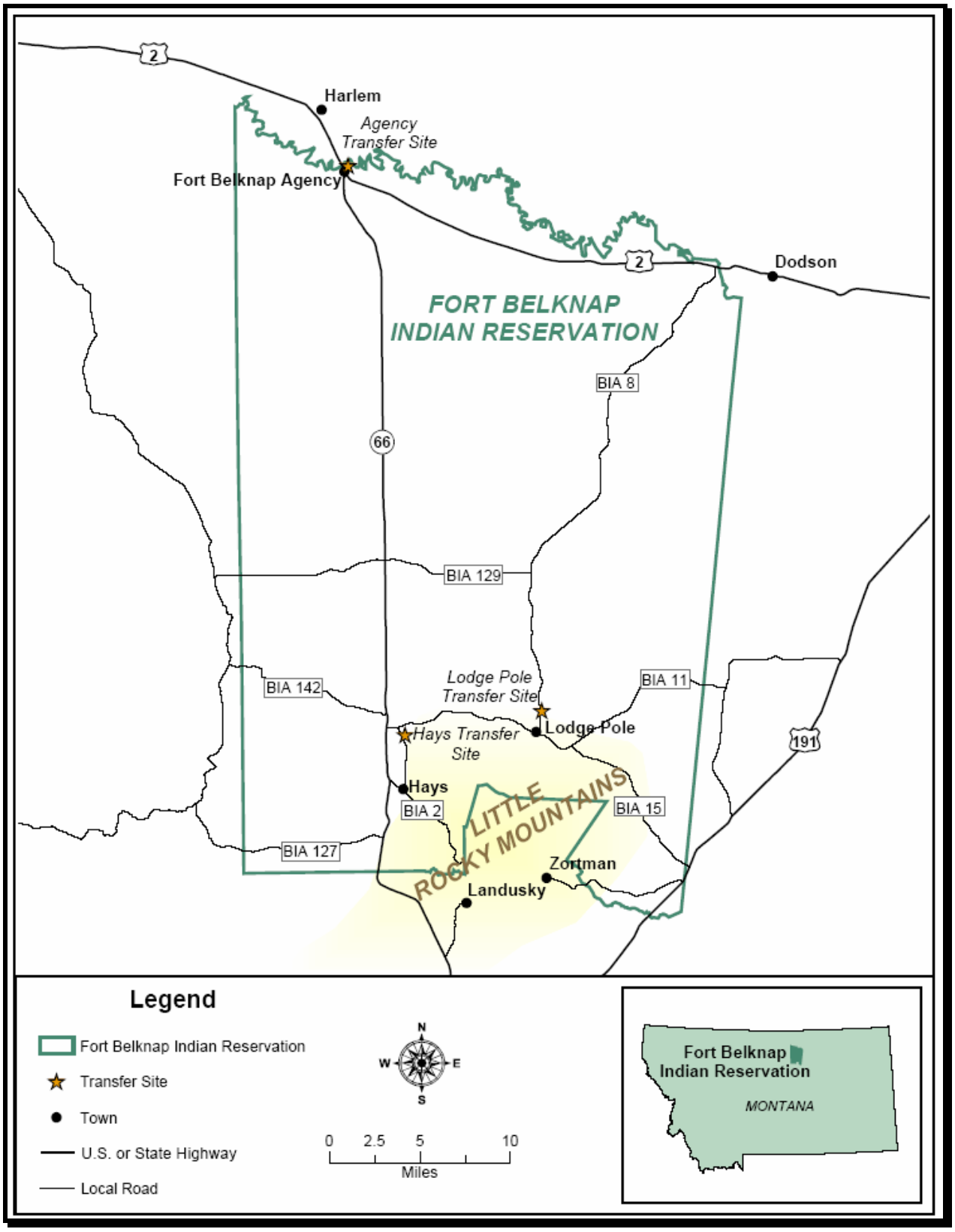
2.1 Geography

The Fort Belknap Indian Reservation takes in approximately 970 square miles in north-central Montana. Members of the Gros Ventre and Assiniboine Tribes occupy the Reservation with the majority of the Tribal members residing in the Fort Belknap Agency, Hays, and Lodgepole communities. Fort Belknap Agency (sometimes referred to as Agency) is located 3 miles southeast of Harlem, Montana, on U.S. Highway 2 near the northwest corner of the Reservation. A map that depicts the Reservation is presented on Figure 1. Fort Belknap Agency is the seat of the Fort Belknap Tribal Government, Agency Bureau of Indian Affairs (BIA), and Agency Indian Health Service (IHS), and the Fort Belknap Housing Authority.

The Reservation encompasses the southeastern portion of Blaine County and an irregular narrow strip pf southwestern Phillips county. Approximately 80 percent of the Reservation is in Blaine County and 20 percent in Phillips County. The Reservation extends approximately 30 miles south from the Milk River to the northern crest of the Little Rocky Mountains. The Reservation is 28 miles wide in the northern part and 25 miles wide in the southern part. The Reservation includes all or parts of Townships 25 to 32 North and Ranges 22 to 26 East, Montana Principal Meridian. The Reservation is almost entirely within the USGS 30 by 60 minute Dodson Quadrangle map while the northwest and southern extremities are covered by the Harlem Quadrangle and Zortman Quadrangle maps, respectively.

Maintained roadways service most homes and businesses on the Reservation. The roads are maintained and under the authority of Montana Department of Transportation (MDT) or the BIA Department of Roads. U.S. Highway 2 runs east-west along the northern part of the Reservation and Montana State Route 66 runs from the junction with U.S. 2 at Fort Belknap Agency south leaving the southern boundary of the Reservation near Hays, Montana (see Figure 1). Both highways are under the jurisdiction of MDT. The BIA routes and private roads serve to connect main roads to the homes and businesses on the Reservation. Large-scale business or industry are non-existing on the very rural Reservation. Havre, Montana, with a population approaching 10,000, is 47 miles west of Fort Belknap Agency. Great Falls, Montana, with a population greater than 56,000, is 160 miles to the southwest.

Figure 1. Map of Fort Belknap Indian Reservation

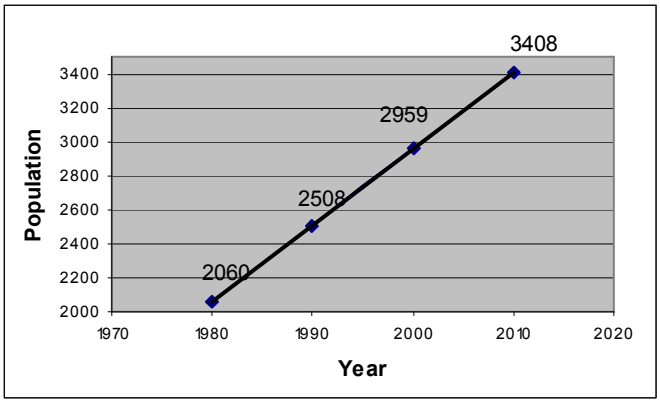


Billings, Montana, with a population of nearly 90,000, is 169 miles south from Hays, which is located near the southern end of the Reservation (see Figure 1).

2.2 Population

According to the U.S. Census Bureau, the population growth on the Fort Belknap Indian Reservation has been steady since 1980. Figure 2 depicts the population change on the Reservation from 1980 to 2000, as taken from the census and projected to 2010.

Figure 2. Population Growth

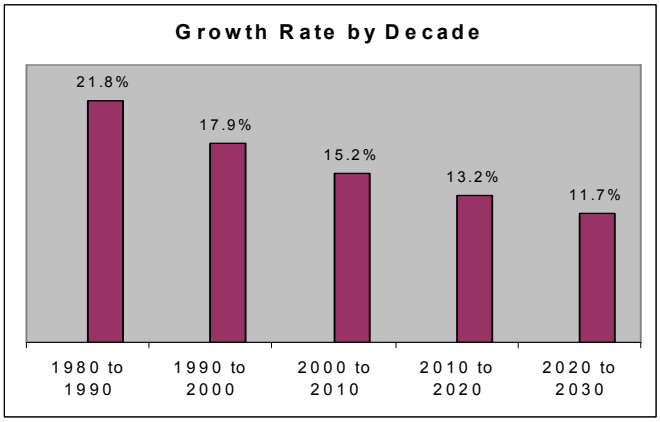


Source: U.S. Census Bureau 1980, 1990, and 2000 populations. 2010 population is projected.

Approximately 35 percent of the population resides in the Hays and Lodgepole areas of the southern portion of the Reservation while 55 percent reside by the Fort Belknap Agency and along U.S. Highway 2 (Mni Sose Intertribal Water Rights Coalition, 2005).

While the population on the Reservation continues to grow, the *rate* at which the population grows is in decline. The average annual population rate of growth per decade is depicted in Figure 3. For estimating solid waste generation rates and developing solid waste management alternatives, a 20-term yearly average growth rate of 1.3 percent is used in this plan. Provided current trends stay true, the population on the Reservation could reach 4,300 by the year 2030.

Figure 3. Population Growth Rate by Decade



For most communities, population growth or decline is dependent on socio-economic conditions. It is expected that the Fort Belknap Indian Reservation base population will continue slow growth into the future.

2.3 History

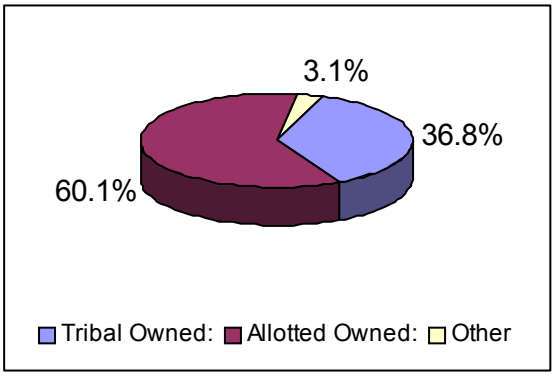
Early inhabitants of the region were the Blackfeet and Gros Ventre Indians. Later, the Assiniboine Indians migrated into the area. Fur traders started coming into the area soon after the Lewis and Clark Expedition of 1804 to 1806 (Hilts 1986). The Gros Ventre, as members of the Blackfeet confederacy, and the Assiniboine Nation signed the Fort Laramie treaties of 1851 and 1855 with the United States Government establishing their respective territories within the continental United States. These territories included all of central and eastern Montana and

portions of western North Dakota (FBIC, 2003). An act of Congress in 1888 further separated these territories into the Blackfeet, Fort Belknap, and Fort Peck Reservations. The Fort Belknap Indian Reservation was established for the Gros Ventre and Assiniboine people who were attached to and receiving rations at the Fort Belknap Agency at that time. Upon gold discovery in the Little Rocky Mountains in 1884, pressure from miners and mining companies forced the Tribes to cede sections of the mountains (FBIC, 2003). A significant portion of the Little Rocky Mountains was removed after Congress approved an agreement, negotiated by a special commission in 1896 (Kappler, 2000).

2.4 Land Use and Ownership

Much of the land on the Fort Belknap Indian Reservation is used in agriculture. The large alluvium floodplain of the Milk River Valley is irrigated and grows grass hay, alfalfa, and other livestock feed crops. Prairies lie between the river valley and the Little Rocky Mountains to the south (see Figure 1). The prairie land is a patchwork of dryland farms and grazing. The Little Rocky Mountains and foothills produce hay and are used for grazing livestock. Additionally, these mountains are a source of traditional foods, medicines, recreation, and cultural activities.

Figure 4. Land Ownership



Source: Mni Sose Intertribal Water Rights Coalition

Figure 4 depicts the land ownership on the Reservation. The state of Montana owns school trust land located in a patchwork of mostly complete sections (640 acres) per township and range. U.S. Highway 2 and State Highway 66 right-of-ways are under easements to MDT. Most land on the Reservation is held in trust for the Tribes or individuals, and protected by the U.S. Government against alienation. Private land is limited.

2.5 Housing

The Fort Belknap Indian Housing Authority manages units in the communities and on rural scattered sites through U.S. Department of Housing and Urban Development (HUD) Low Rent and Mutual Help home ownership housing programs. Other housing is available through the Bureau of Indian Affairs and Indian Health Service for government employees. Private housing is limited (Mni Sose Intertribal Water Rights Coalition).

TABLE 1. COMMUNITY HOUSING UNITS

Community / Cluster	Housing Units
Agency	150
New Town	46
Half Town	60
Rodeo Drive	80
Hays	58
Old Hays	21
Pine Grove (White Cow)	64
Mission Canyon	30
Lodgepole	40
Chief Nosey	15
Leggins	16
Total	580

Approximately 816 total housing units are located on the Reservation. Approximately 71 percent of these housing units are located in various communities and subdivisions, sometimes referred to as cluster sites. Table 1 describes the housing

units-per-community/cluster. The remaining 29 percent of the housing units are located at scattered sites on the Reservation. In this report, "scattered" housing units describes *all* homes not located within communities or cluster sites, which includes private housing units. Of all the housing units on the Reservation, approximately 53 percent are located on the north side of the Reservation, mostly in the Agency area and the Milk River Valley. Approximately 47 percent of the housing units are located in the southern end of the Reservation, particularly in and around the Hays and Lodgepole communities.

2.6 Economy and Natural Resources

The economy and natural resources are primarily agriculturally based – dry farms and cattle ranches. The two largest employers within the Fort Belknap Indian Reservation are the Tribal government and the Bureau of Indian Affairs. Local residents are also employed by the Indian Health Service, the Fort Belknap Community College, schools, and a few small businesses. The FBIC is working to develop tourism and a market for handcrafted Native American arts and crafts.

The U.S. Census Bureau reports that in 2000, the median household income on the Fort Belknap Reservation (and Off-Reservation Trust Land) was $21,225 per year. For the FBIC population of ages 16 years and older, 58.6% were employed in 2000.

2.7 Climate

The northern part of the Reservation, around Fort Belknap Agency, receives slightly less precipitation than southern areas near Hays and Lodgepole. Mean annual precipitation to the north is approximately 12 inches while the south receives closer to 14 inches. The Little Rocky Mountains receive more precipitation than lower ground. While May and June experience greater rainfall, a relatively dry continental climate dominates the Reservation throughout much of the year.

The mean annual temperature at both Fort Belknap Agency and Hays is approximately 43° F. Winter temperatures are cold, averaging about 17° F near the Agency and 22° F at Hays. Warm, southern chinook winds occasionally moderate these systems while cold, artic air masses can drop temperatures to below -20° F or colder, occasionally for several days. High temperatures during July and August normally fluctuate from the high 80's to over 100° F. (WRCC, 2005)

2.8 Vegetation

Vegetation on the Fort Belknap Indian Reservation varies from woodlands in the Little Rocky Mountains to prairie rangelands. The woodlands house a wide variety of trees, including ponderosa pine, quaking aspen, paper birch, lodgepole pine, and Douglas fir. The native vegetation in the prairie has changed by prolonged grazing. In some areas, bluebunch wheatgrass, rough fescue, green needlegrass, winterfat, and western wheatgrass have been replaced by needleandthread, blue grama, shrubby cinquefoil, fringed sagewort, cactus, and clubmoss. (USDA, 1986)

2.9 Geology

Glacial deposits and Quaternary alluvium are extensive on the on the Fort Belknap Indian Reservation however, sedimentary, igneous, and metamorphic rocks ranging in age from Precambrian to Cretaceous, are exposed locally (Bergantino, 2001). The Reservation lies within the Northern Great Plains physiographic province and may be divided into three physiographic units: (1) the Milk River valley, (2) the central plain, and (3) the Little Rocky Mountains and foothills (Fisher, 1976).

The Milk River valley is a broad, flat flood plain bounded on the north and south by low bluffs of glacially deposited material. The valley was originally carved by the ancestral Missouri River prior to Pleistocene glaciation. Following the retreat of the ice, the Missouri River reestablished itself much further south and the Milk River now occupies its original valley. The flood plain is the result of deposition by the meandering Milk River of fine-grained material onto glacial till which in turn overlies alluvium deposited by the ancestral Missouri River (Fisher, 1976).

The central plain extends southward from the Milk River valley about 20-30 miles to the foothills of the Little Rocky Mountains. It is mostly mantled by as much as 80 feet of glacial till and glaciofluvial deposits. Drumlins, boulder trains, knob and kettle topography, and outwash plains, all features characteristic of glaciation, are locally well developed. Locally, meandering streams have cut through the glacial material and have now exposed the underlying Cretaceous rocks. Snake Butte, Wild Horse Butte, and Twin Buttes, break through the central plains. The buttes' summits rise several hundred feet above the plains. The buttes are composed of resistant igneous rocks that were intruded during Tertiary time into less resistant sedimentary formations that later were eroded (Fisher, 1976).

The Little Rocky Mountains are composed of a core of Precambrian metamorphic rocks and Tertiary intrusive rocks surrounded by uplifted and deformed sedimentary formations. The higher peaks rise about 1,500 - 2,000 feet above the central plain, reaching altitudes between 5,000 and 6,000 feet immediately south of the Reservation. The more resistant of the sedimentary formations commonly form hogbacks that dip away from the core of the mountains. Especially well developed is the hogback formed by the Mississippian Mission Canyon Limestone, which nearly surrounds the base of the mountains. Other hogbacks are formed on resistant beds of the Kootenai Formation, the Mowry Shale, the Mosby Sandstone Member of the Warm Creek Shale, the Eagle Sandstone, and the Judith River Formation. Flat gravelly terraces are well developed on the north flank of the Little Rocky Mountains and, in places, have buried the underlying sedimentary rocks. The terraces were formed by debris stripped from the higher parts of the mountains during Late Tertiary and early Quaternary time (Fisher, 1976).

The soils at the Agency transfer station are gently sloped well-drained loams of Telstad-Joplin series. The soils permeability is slow to very slow (USDA-SCS 1986). Static water level within a nearby stock well suggests that the approximate depth to groundwater could be as few as 6 feet. There are no domestic wells in the area. The groundwater flows in a northerly direction toward the Milk River.

The soils near the Lodgpole transfer station are gently rolling, deep, well-drained clay loams, gravelly loams, and loams of the Martinsdale-Shawmut-Turner series of slow to moderately slow permeability (USDA-SCS 1986). Static water levels reported from a nearby stock well suggest

the depth to groundwater of approximately 23 feet. The ground water generally flows in a northwesterly direction. Domestic drinking water in this area is taken from a confined aquifer at greater depths. The soils near the Hays transfer station consists of undulating and gently rolling Bascovy soil of the Bascovy-Lisam-Dilts series of a very slow permeability (USDA-SCS 1986). Static water levels reported from a nearby USGS research well suggest the depth to groundwater of approximately 27 feet. There are no domestic wells in the vicinity of the Hays transfer site.

3.0 SOLID WASTE MANAGEMENT PRACTICES

This section provides details regarding the past and present solid waste management practices on the Fort Belknap Indian Reservation, solid waste characteristics and quantities, and problems associated with open dumpsites. Results of a Tribal member attitudes survey toward solid waste issues are also summarized in this section.

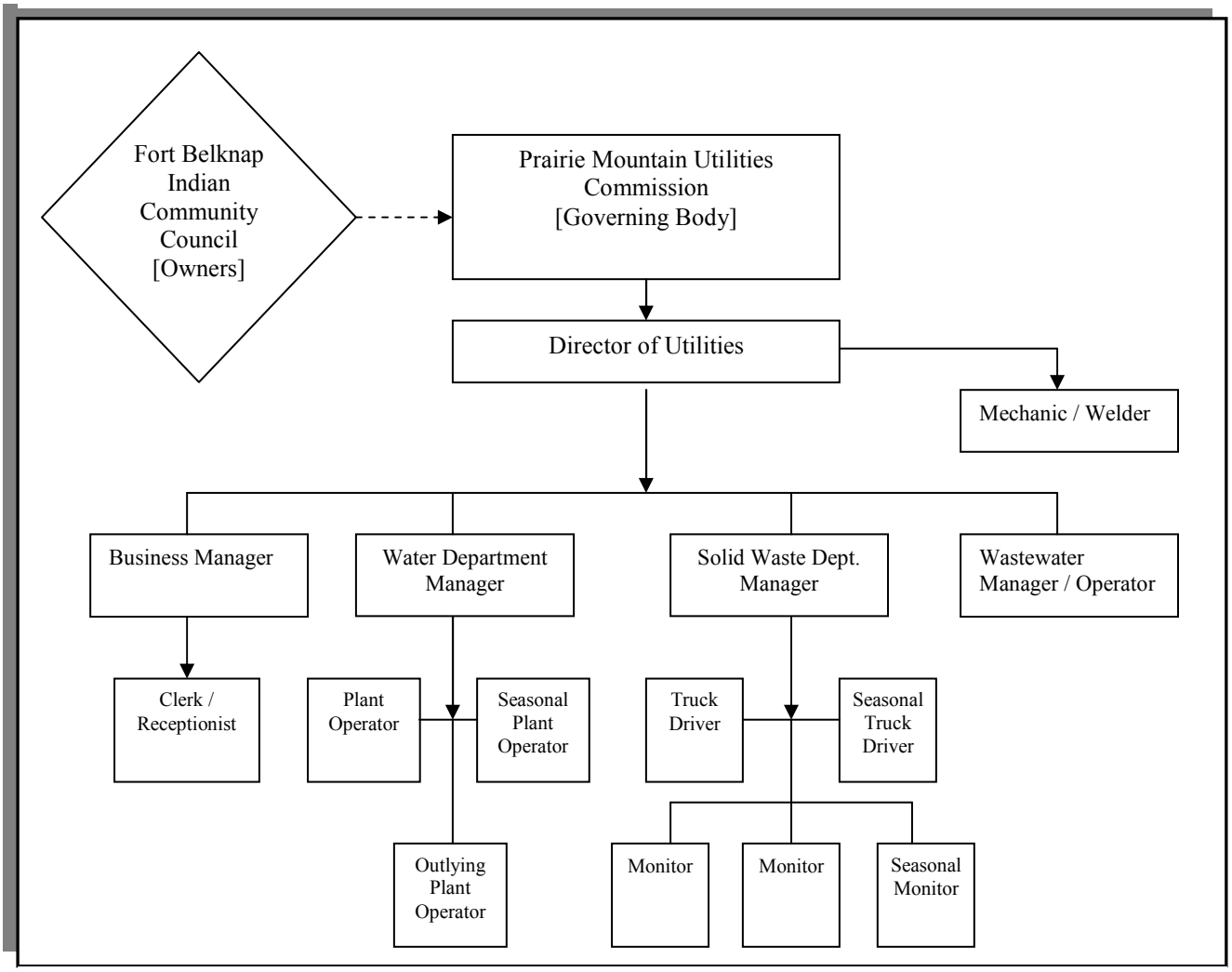
3.1 Summary of Past and Present Conditions

Waste generated on the Reservation had been typically discarded into open dumps. These dumps were usually long trenches located just outside each community. The trenches were periodically set afire. Individuals in scattered housing units sometimes created their own pits to discard garbage. These were also periodically set afire. IHS built a container site at the Agency in December of 1990; however, due to payment conflict this site was not used for several years. The tribe developed their solid waste code in 1992. Roll-off transfer sites similar to that at the Agency were constructed near Hays and Lodgepole. RCRA Subtitle D required the closure of open dumps by April 9, 1994, at which time waste was collected at the roll-off transfer site and hauled to the landfill. The present system for collection and disposing of solid waste was developed in 1995. The system experienced several problems that ultimately led to large piles of waste accumulated at the roll-off transfer sites. Solid waste management, along with water and wastewater, was put under the authority of Prairie Mountain Utilities in an attempt to offer stable management.

The *Solid Waste Management Code of the Fort Belknap Indian Reservation* (Appendix A) establishes the Fort Belknap Solid Waste Director (or Director) position to serve under the Utilities Board, which in turn reports to the FBICC. The Director has broad authority to manage and regulate the storage, collection, transportation, and disposal of solid waste within the external boundaries of the Reservation. The General Provisions, under Section 210(A) of the Code, state that solid waste management meets or exceeds RCRA criteria.

Currently, solid waste generated on the Reservation is managed by Prairie Mountain Utilities hereafter referred to as the "Utilities." The Utilities is a self-sustaining entity of the Tribal Government with directives not only toward handling solid waste, but water and wastewater as well. The Utilities operates the solid waste program under the *Solid Waste Management Code of the Fort Belknap Indian Reservation* and RCRA criteria. The mission statement of the Utilities includes the moral obligation to ensure that consistent solid waste service is satisfactorily provided to every customer. The Utilities strive to treat all customers with respect, courtesy, and professionalism, and provide the highest quality of customer services. Figure 5 displays the Utilities organizational structure.

Figure 5. Prairie Mountain Utilities Organizational Structure.



Prairie Mountain Utilities Organizational Structure (from PMU Business Plan, July 2004).

Although the Utilities' organizational structure is generally as shown on Figure 5, it has varied somewhat in actual implementation. At this time, the solid waste department manager also serves as one of two truck drivers and there are no solid waste monitors at the transfer sites.

The existing waste system consists of collecting several 3 cubic yard (CY) containers with a single Volvo truck with a side-loader and cylindrical compactor of 33 CY capacity. Once the compactor is full, the garbage is transported to the Hill County Landfill near Havre, Montana for disposal at a municipal solid waste (Montana Class II) landfill. Currently there are approximately 260 3-CY containers located on the Reservation, primarily in outlying areas. These containers are emptied twice a week if possible. As of August 2005, the 2002 Volvo compactor truck has been driven nearly 70,000 miles. The Utilities also owns a compactor truck similar to the Volvo, but with only a 25 CY capacity. The smaller compactor truck is not being used at this time and needs a major drive train overhaul.

Additionally, the communities of Fort Belknap Agency, Hays, and Lodgepole have roll-off transfer sites. Each roll-off transfer site consists of a double bay retaining wall, each bay constructed with two sections of reinforced concrete. The Utilities owns eight working 40-CY roll-off containers. Two containers are provided at each of the three roll off sites and two containers are always on the truck. There is one new 40-CY container, however it is not used at this time due to lack of a cover screen. The Agency's roll-off transfer site is partially fenced

with barbed wire extending along U.S. Highway 2 but does not provide an adequate means to keep people from dumping at specific times or from keeping children safely out of the sites. There are no existing fences or gates at the Hays or Lodgepole sites. Local residents report that nonresidents from off the Reservation periodically dump trash and farm-related wastes at the Agency and Lodgepole sites. The roll-offs are loaded with a multi-unit truck/trailer combination, which is capable of transporting two 40-CY containers to the Hill County Landfill. The 1995 Mack truck currently in use for this purpose has been driven nearly 400,000 miles and is approaching the end of its useful life.

The Utilities are operating with a two truck drivers at this time. Although garbage collection and disposal activities attempt to adhere to a schedule, maintenance issues, weather, and personal appointments are often disrupting. Table 2 displays a typical operations schedule.

Total utilities charges to individual homes vary depending on where one lives. This variation reflects the costs of other services not related to garbage collection. Individuals at the Agency are charged $69 every month for combined water, sewer, and solid waste. Individuals in Hays and Lodgepole are charged $47 per month for combined water, sewer, and solid waste. Persons living in scattered housing and not hooked to public water or sewer are charged $20 per month. Businesses and government institutions such as the Tribal Offices, Indian Health Service (IHS) hospital, and the Fort Belknap Housing Authority are each charged $300 per month, while a cut rate of $150 per month applies to churches and some other businesses.

The tipping fee at the Hill County landfill is currently $64 per load. Although the landfill has a Montana Class III dumping area in addition to the Class II, there is no price credit for the difference. The landfill does not charge for recyclables such as white goods; however, freon removal is required. Future tipping fees will be based on weight (Vincent, 2004).

TABLE 2. TYPICAL LOAD COLLECTION AND TRANSFER SCHEDULE

Community	Truck	Monday	Tuesday	Wednesday	Thursday	Friday
Agency	Compactor		1/3*		1 &1/3	1
	Multi-Unit	1		1		
Hays/ Lodgepol	Compactor		2/3		2/3	
	Multi-Unit			1	1	
Total Trips	Compactor		1		2	1
	Multi-Unit	1		2	1	

*Fractions indicate the portion of the compactor truck's payload filled by location.

3.2 Waste Characteristics and Quantities

This section provides information regarding waste characteristics and quantities associated with this study. Included are the definition of municipal solid waste (MSW), MSW physical and chemical characteristics, and waste generation rates.

3.2.1 Definition of Solid Waste

Before the physical characteristics of solid waste can be quantified, solid waste must be defined. Municipal solid waste means garbage, refuse and similar solid waste material discarded from residential, commercial, institutional and industrial sources. The term does **NOT** include-

- Any solid waste identified or listed as hazardous wastes under section 3001 of the Solid Waste Disposal Act (42 U.S.C. 6921) other than any hazardous waste that is contained in residential solid waste (conditionally-exempt small quantity generator hazardous waste is allowed to be managed as solid waste);

- Materials and products from a dispenser or distributor to the manufacturer for credit, evaluation and possible reuse;

- Any solid waste including contaminated soil and debris, resulting from response action taken under section 104 or 106 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 (U.S.C. 9002 or 9606) or a corrective action taken under that act; and

- Any solid waste that is generated by an individual facility and transported for the purpose of containment, storage, disposal to a facility that is owned by the generator or a company with which the operator is affiliated.

The ***terms*** that define municipal solid waste which are discussed herein are as follows:

- Solid Waste – Solid Waste is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or any air pollution control facility and other discarded material.

- Garbage – A component of municipal solid waste, refers to discarded food wastes including waste accumulation of animal, fruit or vegetable matter used or intended for food, cooking, dealing in or storing of meat, fish, fowl, fruit or vegetable.

- Refuse – A component of municipal solid waste, can be putrescible and nonputrescible solid waste (except body wastes) including discards, rubbish, ashes, incinerator ash, street cleaning and market commercial, office and industrial wastes.

- Residential Solid Waste – Solid waste materials discarded from single and multi-family dwellings and individuals. These include paper, plastic, glass, metal, rubber and leather, textiles, food wastes, yard and wood wastes, inorganic materials and mixed recyclables separated for the purposes of recycling.

- Commercial Solid Waste – Solid waste materials discarded from commercial enterprises engaged in the buying and selling of goods and services. Commercial solid waste would be categorized as similar in nature to that of residential and would included mixed recyclables separated for the purposes of recycling.

- Recyclables – Recyclables consist of solid waste materials removed from municipal solid waste streams, and are either clean or mixed recyclables separated by the generator or owner of the solid waste for purposes of recycling.

- Conditionally Exempt Small Quantity Generator (CESQG) Hazardous Waste – Small amounts (no more than 100 kilograms per month from the generator) of hazardous waste materials meeting the requirements of 40 CFR Part 261.5. CESQG hazardous waste can be managed in a licensed municipal solid waste landfill or a non-municipal, non-hazardous waste disposal unit.

3.2.2 Physical and Chemical Composition of Municipal Solid Wastes

Municipal solid waste can be described by its composition, moisture content, and density. These characteristics affect the type of management and disposal system needed including waste collection, transfer and disposal. The U.S. Environmental Protection Agency (EPA, 2002) provides an estimate of municipal solid waste composition by weight, as shown on Table 3.

Note: Figures in Table 3 represent the discards after recovery by recycling and composting.

TABLE 3. TYPICAL COMPOSITION OF MUNICIPAL SOLID WASTE (EPA, 2002)

Waste Material	Composition by Weight
Paper and Paperboard	29.2 %
Glass	6.1 %
Metals:	
Ferrous	5.5 %
Aluminum	1.4 %
Other Non Ferrous	0.3 %
Plastics	14.4 %
Rubber and Leather	3.5 %
Textiles	5.0 %
Wood	7.5 %
Other Materials in Products	2.0 %
Food Wastes	15.6 %
Yard Trimmings	7.4 %
Miscellaneous Inorganic Wastes	2.1 %

The national averages shown on Table 3 illustrate the general composition of waste by which we can make baseline assessments, pending the availability of more specific data for the Tribal waste stream.

In January 2005, Tribal employees (Gene Talksdifferent, Jimmy Gardipee, and Dean Stiffarm), Portage (John Kill Eagle), and a representative from the Montana Rural Water Systems (Laura Nicolai) conducted a waste sort of one 40-CY container at the Agency roll-off transfer site. The entire full 40-CY container was dumped onto the work area surface. The waste was separated in to three categories, (1) residential waste, (2) commercial waste, and (3) cardboard. The category volumes were measured.

In addition to the waste sort operation, the Utilities provided actual weights from both trucks. The present truck driver and the previous truck driver both detoured to a weighing station during the drive to the landfill, specifically to provide information for this report. This was done with both the multi-unit truck carrying the large 40-CY containers and the compactor truck used to empty the 3-CY containers. The present truck driver accomplished this on every trip for a week in early March, thus providing the amount of waste generated by the Reservation for typical week during the winter. Table 4 displays the results of the waste sort showing each categories percent by volume. Table 4 also shows the estimated percent by weight of each category calculated from waste sort and the multi-unit truck weights.

TABLE 4. WASTE CHARACTERIZATION DATA (from waste sort and truck weights).

Waste Category	Volume (measured)	Weight (calculated)
Residential	53.5 %	48.4 %
Commercial	25.0 %	45.1 %
Cardboard	21.5 %	6.5 %

Based on the number of trips to the landfill and the average weights of the trucks, it appears the per capita average daily weight of MSW generated on the Reservation is 4.0 pounds per capita. This is slightly lower than the national average of 4.51 pounds/day per capita (EPA 2002). Alternatively, if the Reservation's generation rate is calculated from the total weight of the particular week data was collected, the results show 4.5 pounds/day per capita.

3.2.3 Moisture Content of Solid Waste

The amount of moisture in solid waste affects collection routines and disposal methods by impacting the weight collected on a route. For example a high percentage of food and vegetative waste might make the argument for a composting program. Moisture content and composition will vary with the season and the impacts of seasonal residents within the area. For a baseline, an overall moisture content of 20% to 25% will be considered typical for MSW created in the FBIC waste stream.

3.2.4 Density of Solid Waste

Typical densities for solid waste are reported by the Solid Waste Association of North America (SWANA), and listed by source in Table 5.

TABLE 5. TYPICAL WASTE DENSITIES (SWANA, 1995)

Source	Description	Density (pounds/cubic yard)
Residential solid waste	Curbside density	250
Municipal solid waste	Within compaction collection vehicle	750
Commercial solid waste	Uncompacted density	500

There are collection vehicles that will achieve compaction rates of 1,000 pounds per cubic yard, however, those currently used by the FBIC are not of such capacity.

3.2.5 Chemical Composition of Solid Waste

The chemical composition of solid waste has not been analyzed as part of this study, because the FBIC does not propose utilizing waste-to-energy disposal methods (i.e., incineration). A general rule of thumb for identification purposes only is that the heating value for municipal solid waste averages about 5,000 BTU per pound.

3.2.6 Waste Generation Rate

With the exception of the solid waste sort described in Section 3.2.2, a site-specific waste stream characterization has not been done for the FBIC. For purposes of this plan, it is assumed that waste volumes generated by Tribal households will be the similar to national averages. Further waste characterization studies would be necessary to accurately determine Tribal generation rates.

The U.S. Environmental Protection Agency (EPA) completed a solid waste analysis that is reported in the document entitled *Characterization of MSW in the United States: 2000 Update*. (EPA, 2002). The EPA document provides waste generation estimates based on population. The EPA estimates that in 2000, there were 4.51 pounds per person per day of MSW generated. A typical breakdown of this (adjusted to 5 lbs/person/day) is shown graphically in Table 6. After recycling and diversion those numbers were reduced to 3.15 pounds per person per day. The EPA's data would also suggest that a reasonable range for residential wastes is 55 to 65 percent of the total MSW generation. Commercial wastes would likely range between 35 to 45 percent of the total MSW generation. (EPA, 2002)

Based on the proportions reported by EPA and local economic conditions, 2.8 pounds per person per day is used in this plan to estimate the base (household derived) solid waste generation rate on the Fort Belknap Indian Reservation. A comparison of the truck weight measurements to population indicates the total MSW generation rate is 5.2 lbs/person/day. The total figure is used to develop alternatives within this plan.

For purposes of developing and comparing solid waste management alternatives, a total FBIC solid waste generation rate was estimated. The total includes waste generation based on population adjusted for a 1.3 % annual growth rate; waste from commercial, industrial, and institutional sources; and waste from seasonal sources. In consideration of all of these factors, the estimated annual waste generation rate for the next 20 years is 4,138 tons per year. A 20-year period was used in this analysis because it corresponds to each alternative's design life.

TABLE 6. TYPICAL SOLID WASTE GENERATION RATE PER CAPITA

Waste Material	Generation Rate, Pounds per Person per Day
Paper	1.7
Glass	0.3
Metals	0.3
Plastics	1.0
Rubber and Leather	0.1
Textiles	0.1
Wood	0.3
Other	0.1
Total Materials in Products	3.9
Food Wastes	0.3
Yard Trimmings	0.7
Misc. Inorganic Wastes	0.1
Total MSW Generated	5.0

3.3 Open Dumpsites and Burning

There are several open dumpsites within the Fort Belknap Indian Reservation. The older dumpsites have been inactive since the mid-1990's while recent dumping continues to occur in some areas. Open dumpsites are located in Hays and Lodgepole near the present roll-off transfer sites. Several dumpsites were located at or near the Agency; two have been classified as EPA Brownfields sites.

Additionally, large amounts of municipal solid waste have accumulated near all three roll-off transfer sites with Agency and Hays having the most accumulation. When the transfer sites were initially built, they were adequately maintained. Recyclables (metals, white goods, construction debris) were separated into temporary piles for future removal. Over time people discarded all waste onto these piles and the accumulated outcome is large amounts of waste that are in effect, open dumps. This problem is the result of interruption of services and inefficient oversight due to on-going change of utilities staff, lack of maintenance of the roll-off transfer sites, constant mechanical problems, and lack of funds. People now routinely dump garbage into these dumpsites. Approximately 6,700 cubic yards of municipal solid waste is piled at the Hays and Agency transfer sites. The accumulated pile at the Lodgepole site is estimated at 2,193 cubic yards. These dumpsites and the 40-CY containers are sometimes set afire.

Open dumpsites create various human health and environmental hazards. Health hazards exist from an increased insect and rodent population. Dogs rummaging through the disposal site are another possible disease vector. Many physical hazards are present due to cutting or piercing objects, poisonous gases, and fire or explosions. Table 7 summarizes many of the hazards associated with open dumpsites.

Contamination of the air occurs when solid wastes are openly burned. Burning can be particularly dangerous when the waste burned includes hazardous materials and plastics. Federal laws prohibit burning of most municipal solid waste materials.

TABLE 7. HEALTH PROBLEMS ASSOCIATED WITH OPEN DUMPSITES

Biological Factors	Air Contaminants	Water Polluters	Physical Hazards
Flies -Dysentery -Salmonellosis -Hepatitis Rats (rodents) -Leptospirosis -Plague -Hantavirus Ticks -Rocky Mountain Spotted Fever Mosquitoes -West Nile Virus Dead Animals -Anthrax -Tularemia Living Animals -Rabies Medical Waste	Burning pollutes the air with particulate matter and can also release toxic chemicals. Freon, other CFCs Old Batteries	Contamination of surface and ground water by heavy metals, organic constituents, etc. Soil contamination	Cutting or piercing objects (glass, nails, hypodermic needles). Poisonous Gases Fire or explosions

3.4 Tribal Solid Waste Management Attitudes Survey

A waste management attitudes survey was conducted on May 12th and 13th, 2005. The written survey was distributed to and completed by residents attending a luncheon during the Spring Cleanup Days. The purposes of the survey were to assess individual disposal practices, acceptable costs of solid waste management, and to determine whether any recycling efforts would be accepted by the community as a whole. There were 134 responses to the survey, representing approximately 16% of the total number of households on the Reservation.

It was found that Fort Belknap residents are utilizing various methods of disposal at this time. Some members are hauling waste to the community container sites while others utilize the small containers (dumpsters). Several persons admitted to burning garbage, throwing garbage in a

coulee, or burying their waste. Most people use plastic bags for disposal, although many of the respondents simply empty unlined trash cans or other containers into the waste collection system.

A majority (93%) of the participants believe that solid waste management practices on the Reservation should be improved. This indicates the community's willingness to accept alternative methods as long as they are affordable and convenient. It was found that 50% of those surveyed would be willing to pay a small fee for a collection service if available. Of those polled, 16% would pay up to $10.00 per month, 26% stated they could not afford to pay anything or were not willing to pay, and the remaining 58% would pay a small amount for improved service.

Source reduction through recycling was supported by 90% of those surveyed. This is an indication that residents would likely play an active role in diverting materials from disposal, reduce waste generation, and provide a baseline for building a recycling enterprise. The survey also indicated that most residents would be willing to separate recyclables and take them to a recycling center.

In conclusion, the survey was well received and support improvements to solid waste management would be accepted by many of the Fort Belknap residents. Data for the solid waste management survey is included in Appendix B.

4.0 SOLID WASTE MANAGEMENT ALTERNATIVES

The goal is to successfully manage solid waste generated on the Fort Belknap Indian Reservation through responsible solid waste collection, storage, transportation, and disposal. Solid waste management alternatives are evaluated and described within this section.

4.1 Preliminary Screening of Alternatives

A preliminary set of alternatives was identified for this study. Preliminary solid waste management alternatives were discussed by FBIC representatives and Portage personnel in October 2004 and February 2005. The list was reduced to the most feasible alternatives, which were retained for more detailed evaluation. Alternatives retained for further analysis are described in Table 8.

Three alternatives that were eliminated from further consideration include (constructing and operating) a Subtitle D landfill, a waste incinerator, and a full-scale transfer station.

A Subtitle D landfill is not further considered for the following reasons:

- ***Siting***. There are stringent siting requirements for new landfills. Public acceptance of a new landfill site is very difficult to achieve.
- ***Construction and operational costs***. Constructing and operating a municipal solid waste landfill that meets 40 CFR 258 requirements is expensive. Large landfills are better able to control unit costs than small landfills because of the economy of scale.
- ***Financial Assurance costs***. In accordance with 40 CFR 258, sufficient monies must be set aside for closure and post-closure care, prior to the site accepting any waste.

- ***Operating Compliance***. Certain hazardous materials are not permitted to be disposed of in a sanitary landfill; open burning is not permitted; deposited waste must be compacted daily (before covering); a daily cover of 6 inches of earth or a synthetic liner over the disposed waste is required; groundwater must be monitored during the life of the site as well as for 30 years after the site is closed; and the site must be fenced to control blowing litter as well as limiting access. These factors require the presence of an operator to assure enforcement.
- ***Liability***. Even though a site is constructed and operated in accordance with all the criteria, the owner/operator will always be liable for injuries and damages resulting from contamination.

Significant concerns related to waste incineration include:

- Air quality
- Increasing compliance costs related to air emissions
- High capital expenditures and O&M costs
- Very limited energy recovery benefit from small waste volumes

A full-scale transfer station normally consists of a centrally located building from where solid waste is collected, sorted, and loaded into large haul trucks for transfer to a regional landfill. Normally, this type of system is used for larger populations involving relatively long haul distances to the landfill.

The Fort Belknap Indian Community population is not large enough to make a centrally located transfer station economically feasible. The amortized facility and equipment capital costs would contribute to very high unit costs. Further, the population is geographically separated with nearly equal portions of solid waste generated and collected from the northern (Agency) and southern (Hays-Lodgepole) halves of the Reservation. A single transfer station would not meet the needs of all residents.

Based on a review of the existing system, the general location of each of the three transfer (roll-off) sites appears to be appropriate. Having three sites (near Fort Belknap Agency, Lodgepole, and Hays) located within a reasonable distance of the population centers minimizes individual haul distances and reduces the incentives for illegal dumping. Additional transfer sites would not be feasible because the remaining population is scattered on farms and ranches across the Reservation.

The Hays and Lodgepole transfer sites are reasonably sited (see maps in Appendix C), within reasonable driving distance for local users but removed from residential areas. The current Agency transfer site location is not ideal because it is closer to homes, highly visible, alongside a primary highway (U.S. Route 2), near the Milk River and easily accessible to non-Reservation users. Although a separate alternative for re-locating the Agency transfer site has not been developed within this plan, a cost estimate and likely impact to solid waste fees is has been developed for future consideration by the Tribal Council.

TABLE 8. SOLID WASTE MANAGEMENT ALTERNATIVES

Solid Waste Management Alternative	Description	Further Information
A. Existing System	Continue to manage three transfer sites; collect/haul waste from the present number of small containers with a compactor truck to the Hill County Landfill; independently transfer and haul roll-off containers to the same landfill.	System utilizes existing equipment; however, it is assumed that haul trucks are replaced so as to continue operating over a design life of 20 years.
B. Modify Existing System	Collect waste from small container sites with compactor truck and off-load compacted wastes into the 40-CY roll-off containers, aided by a steel chute system. All loads to Hill County Landfill are delivered in the roll-off truck & trailer.	It is assumed that haul trucks are replaced so as to continue operating over a design life of 20 years. Provide additional small containers. Transfer sites are monitored and open to residents four days/week to better manage waste and prevent unauthorized dumping.
C. Attended Container Sites with Waste Handling Equipment	Station full-time attendants at the transfer sites; provide heavy equipment to handle and compact waste into the 40-CY containers to reduce the number of roll-off truck/trailer loads and hauls; use existing compactor truck to collect/haul waste from small containers.	Collection and hauling is similar to the existing system except additional 3-CY small containers are provided to reduce the compactor truck mileage. Transfer sites are monitored and open to residents four days/week to better manage waste and prevent unauthorized dumping.
D. Stationary Compactor at Agency Site	Install a mechanical compactor at the Agency transfer site to reduce the number of roll-off truck/trailer loads and hauls; continue to use existing compactor truck to collect/haul waste from small containers; provide heavy equipment to handle and compact waste into 40-CY containers at the Hays and Lodgepole transfer sites.	Collection and hauling is similar to the existing system except additional 3-CY small containers are provided to reduce the compactor truck mileage. Transfer sites are monitored and open to residents four days/week to better manage waste and prevent unauthorized dumping.

4.2 Landfill Disposal Options

Municipal solid waste landfills operating in north-central Montana include those in Glasgow, Malta, Hill County (near Havre), and Great Falls. These landfills are summarized in Table 9.

The City of Malta landfill only serves the local community so it is not a viable alternative. The Glascow and Great Falls landfills have comparable tipping fees but are located at much greater distances from Fort Belknap Agency than the Hill County landfill. For purposes of evaluating solid waste management alternatives, it is assumed that waste will be hauled to the Hill County landfill for disposal.

TABLE 9. NORTH-CENTRAL MONTANA LANDFILLS

Landfill	Approximate Distance to Fort Belknap Agency	General Information
Glascow, MT	116 miles	Accepts waste from outside Valley County. Operated by the Valley County Refuse District. Charges $20.00/ton for municipal solid waste (Montana Class II). Accepts different classes of waste at varying prices.
Malta, MT	42 miles	Serves the City of Malta only; outside waste not accepted.
Hill County, MT	40 miles	Accepts waste from outside Hill County. Operated by the Hill County Health Department (HCHD). Remaining life of current landfill is 5-6 years; HCHD expects to open a new landfill before current capacity is reached. Charges $64.00 per container (one roll-off or compactor load) of municipal solid waste (Montana Class II). Future plans include installing a scale and charging by weight.* A construction/demolition waste (Montana Class III) landfill is part of the facility; charges same as Class II. Friable asbestos not accepted; non-friable asbestos containing materials are accepted. No charge for recyclable wastes delivered to the landfill.
Great Falls, MT	140 miles	Accepts waste from outside Cascade County. Operated by Montana Waste Systems. Charges $24.86/ton for municipal solid waste (Montana Class II). Accepts different classes of waste at varying prices.

*Estimated future cost, derived from March 2005 measured load weights of the FBIC roll-off containers and compactor truck, is $22.33/ton.

4.3 Transfer and Haul Alternatives Evaluation

There are many alternatives and combinations of components that make up the alternatives that can be implemented for solid waste management. The alternatives selected in this evaluation are shown to demonstrate four distinctly different solid waste management systems. This section describes solid waste management alternatives, with emphasis placed on various transfer and haul scenarios. Other integrated solid waste management issues are discussed in Section 5.

The following assumptions are used to evaluate and compare the four alternatives listed in this section:

- New rolling stock (haul trucks) is included in the cost of each alternative (including the existing system). This is because older equipment is subject to breakdowns that can temporarily shut down hauling operations.

- Site security is included – each roll-off transfer site is fenced and locked during off hours.

- Alternative A does not change the current hours of use; Alternatives B, C and D reduce the days and hours of use from current operations.

4.3.1 Alternative A – Existing System

Description: Residents dispose of household solid wastes at three transfer sites: Fort Belknap Agency, Hays, or Lodgepole. The transfer sites have areas for collection of white goods and scrap metal. Other waste is not sorted or compacted in the roll-off containers. Additionally, less than 300 small (3-CY) containers are serviced by a side-loader compactor truck. All solid waste collected within the Fort Belknap Indian Reservation is hauled from the roll-off transfer sites or via the compactor truck to the Hill County landfill. Transfer sites remain unattended and open every day.

Pros: Existing infrastructure and equipment is used. Roll-off containers and the small (3-CY) containers are standardized throughout the Reservation.

Cons: There is very limited site security at the transfer sites. There is a potential for worker or user exposure to health hazards (e.g., disease vectors such as rodents) or hazardous chemical substances, so the FBIC has this liability. The FBIC is responsible for disposal of any hazardous materials or other wastes dumped at the container sites by unauthorized users.

4.3.2 Alternative B – Modify Existing System

Description: In this alternative, wastes collected from the small (3-CY) containers serviced by the compactor truck are hauled to either the Agency or Hays transfer site. A ramp/chute system is provided at these locations for the purpose of transferring waste from the compactor truck to a 40-CY roll-off container. All solid waste collected within the Fort Belknap Indian Reservation is hauled by a roll-off truck/trailer from the roll-off transfer sites to the Hill County Landfill.

The number of small containers is doubled from the current number in service. The compactor truck services each small container site once a week. Each transfer site is open for general use from 7:30 a.m. to 5:30 p.m. on Tuesday through Saturday, five (5) days per week. The Utilities Department is the only authorized entity to have keyed access to the three transfer sites.

Pros: The solid waste system's efficiency is greatly improved because:
- compactor truck mileage on local collection routes is reduced by half
- compactor truck hauls to the landfill are eliminated
- the number of landfill hauls is cut by one third
- labor otherwise used for hauling can be applied to monitoring the transfer sites

The monitored transfer sites reduce or eliminate:

- unauthorized dumping
- the expensive handling and disposal of restricted items
- health hazards associated with random dumping
- uncontrolled rodent infestations and other disease vectors

Cons: This alternative introduces significant changes from past operating practices. A comprehensive community outreach program is needed to educate all system users (both private and Tribal government) regarding new solid waste management practices.

There is a potential for worker exposure to hazardous substances. The FBIC remains responsible for general site security, any unauthorized use, or hazardous wastes dumped at any container sites.

4.3.3 Alternative C – Attended Transfer Sites with Waste Handling Equipment

Description: In this alternative, the roll-off transfer sites are monitored full-time, and waste handling equipment is used to sort, load, and compact waste into 40-CY roll-off containers. This alternative reduces the number of roll-off truck/trailer loads and hauls. Collection and hauling is similar to the existing system except additional small containers are provided to reduce the compactor truck mileage.

The number of small containers is doubled from the current number in service. The compactor truck services each small container site once a week. Each transfer site is open for general use from 7:30 a.m. to 5:30 p.m. on Friday through Monday, four (4) days per week. Tribal Housing, Tribal Construction, and other entities approved by the FBIC Council will have keyed access to the transfer sites for authorized use during those times outside of normal operating days/hours.

Pros: Waste handling equipment can sort and compact waste to some extent. The compaction will reduce the volume hauled and thereby lower haul costs.

Fully monitored transfer sites reduce or eliminate:
- unauthorized dumping
- the expensive handling and disposal of restricted items
- health hazards associated with random dumping
- uncontrolled rodent infestations and other disease vectors

Cons: This alternative introduces significant changes from past operating practices. A comprehensive community outreach program is needed to educate all system users (both private and Tribal government) regarding new solid waste management practices.

Compared to the existing system, additional labor and equipment is needed to implement this alternative. There is a potential for worker exposure to hazardous substances. The FBIC

remains responsible for general site security, any unauthorized use, or hazardous wastes dumped at any container sites.

4.3.4 Alternative D – Stationary Compactor

Description: In this alternative, container sites are monitored full-time and a mechanical compactor at the Agency roll-off transfer site is used to decrease the waste volume. A site attendant operates the compactor and directs users where to place various types of waste. This alternative reduces the number of roll-off truck/trailer loads and hauls from the north half of the Reservation. Collection and hauling is similar to the existing system except additional small containers are provided to reduce the compactor truck mileage.

The number of small containers is doubled from the current number in service. The compactor truck services each small container site once a week. Each transfer site is open for general use from 7:30 a.m. to 5:30 p.m. on Friday through Monday, four (4) days per week. Tribal Housing, Tribal Construction, and other entities approved by the FBIC Council will have keyed access to the transfer sites for authorized use during those times outside of normal operating days/hours.

Pros: The number of loads hauled to the landfill is reduced from the current number.

Fully monitored transfer sites reduce or eliminate:

- unauthorized dumping
- the expensive handling and disposal of restricted items
- health hazards associated with random dumping
- uncontrolled rodent infestations and other disease vectors

Cons: The mechanical equipment requires regularly scheduled maintenance for trouble free operation. The stationary compactor may be subject to vandalism.

This alternative introduces significant changes from past operating practices. A comprehensive community outreach program is needed to educate all system users (both private and Tribal government) regarding new solid waste management practices.

Compared to the existing system, additional labor and equipment is needed to implement this alternative. There is a potential for worker exposure to hazardous substances. The FBIC remains responsible for general site security, any unauthorized use, or hazardous wastes dumped at any container sites.

4.4 Cost Estimates

Cost estimates have been prepared for each alternative. The cost estimates are based on vendor/supplier data, information from FBIC, and similar studies. Table 10 summarizes the alternatives and estimated costs. Appendix A provides a cost breakdown for each alternative.

Important Note:

Waste transfer, hauling and disposal fees have been estimated for purposes of comparing alternatives. Actual waste handling, transportation, and disposal fees could vary from these estimates pending actual equipment selection, fuel/energy costs, and operational efficiency.

TABLE 10. ESTIMATED TRANSFER AND DISPOSAL COSTS

Alternative	Capital Cost	Annual Operating Cost	Present Worth, at 4% APR and 20 years	Cost per Ton of MSW	Average Cost per Housing Unit**	
					Annual	Monthly
Baseline*	$0	$282,000	$3,839,000	***$90***	$246	$21
A. Existing System	$339,000	$481,000	$6,875,000	***$122***	$369	$31
B. Modify Existing System	$372,000	$498,000	$7,146,000	***$127***	$387	$32
C. Attended Sites with Waste Handling Equipment	$479,000	$535,000	$7,748,000	***$138***	$428	$36
D. Stationary Compactor	$456,000	$530,000	$7,664,000	***$136***	$423	$35

*The baseline costs indicate approximate existing system costs using current waste generation rates without any consideration for growth, additional personnel needs, energy cost increases, new equipment, or site improvements.
**This assumes that government offices, businesses, etc. continue to pay approximately 30% percent of the system costs, as with the current system.

4.5 Other Solid Waste Management Considerations

This section describes other solid waste management considerations, specifically issues related to a construction/demolition landfill, waste handling and sorting, the use of a cardboard baler or compactor, and household hazardous waste.

4.5.1 Construction/Demolition Landfill

A construction/demolition (Montana Class III) landfill is sometimes used to reduce the volume of waste that must be hauled to a regional landfill. Group III wastes are wood wastes and non-water soluble solids, such as brick, dirt, rock, concrete, wood materials, brush, lumber, and other clean wastes that do not contain hazardous waste constituents. Asphalt, metals, painted or treated wood, leaves and grass clippings, paper and cardboard, gypsum board (drywall), and mixed construction and demolition debris (such as insulation, asphalt shingles, galvanized metal, copper wire, etc.) are considered Group II wastes and not accepted at a Class III landfill.

A Class III landfill must be operated such that unwanted garbage or hazardous materials are not introduced into the fill. Periodic cover is applied and compacted to discourage rodent infestations and minimize settlement of the fill surface. Class III landfill sites must be

monitored, access must be controlled, and the facilities must be sited and operated in a manner that will prevent impacts to groundwater and surface water.

Another type of landfill approved within the State of Montana is a Class IV landfill. This type of landfill must meet many of the Class II landfill requirements, including site restrictions and groundwater monitoring. Class IV landfills are typically unlined and accept Group IV wastes consisting of mixed construction/demolition waste and asphalt, without regulated hazardous waste. The Class IV landfill is not further considered within this plan because many of the requirements are similar to a Subtitle D (Class II) landfill, which was eliminated during the preliminary screening of alternatives (refer to Section 4.1).

4.5.2 Waste Handling and Sorting

Waste segregation at the roll-off transfer sites offers several benefits. White goods can be isolated for Freon removal, future loading, and recycling. Car bodies, iron, and other metal scraps can likewise be stockpiled and recycled.
If an attendant is onsite, that person can manage wastes such that containers are optimally loaded to achieve higher densities, reducing the overall number of trips to the landfill.

In some areas it is permitted to burn clean wood wastes. Such activities would need to be approved by the FBIC Council and Fort Belknap Air Quality program and must comply with Tribal ordinances and policies.

Section 5 provides further information regarding waste sorting, minimization, and recycling.

4.5.3 Cardboard Baler or Compactor

There are numerous types of commercially available balers and compactors. Generally, balers are used to condense and package recyclable goods for shipping. Compactors are used to reduce waste volume for transportation to a disposal site. Both the national figures and the FBIC waste sort indicate the volume of cardboard can be significant. The use of a mechanical baler or compacter for this material will reduce hauling costs.

4.5.4 Household Hazardous Waste

The U.S. Environmental Protection Agency describes household hazardous waste as leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients. Household hazardous waste products, such as paints, cleaners, oils, batteries, and pesticides, that contain potentially hazardous ingredients require special care when disposed.

Each alternative includes management of household hazardous wastes. The roll-off transfer sites will provide separate containers for certain household hazardous waste items. Some of these items may be disposed in a municipal solid waste landfill; others will be separated and managed through a reuse or recycling program. An annual collection day for household hazardous waste items is another option that will reduce illegal dumping.

5.0 WASTE MINIMIZATION AND EDUCATION PROGRAMS

This section describes waste minimization measures and public education to be considered in support of the FBIC solid waste management program.

5.1 Recycling

Individuals can deliver recyclables to markets in Havre, but other recycling opportunities are currently limited. The following sections describe many aspects of recycling, including recyclable materials, collection methods, markets, and opportunities available to FBIC residents.

5.1.1 Recyclable Materials

The composition of the waste streams is important in determining the potential for recycling and composting. The types of commodities accepted will be determined by marketability. Certain portions of the waste stream will be recycled more economically than others. Current recycling in north-central Montana is summarized on Table 11.

TABLE 11. CURRENT RECYCLING IN NORTH-CENTRAL MONTANA

MATERIAL	DESCRIPTION	WHERE TO RECYCLE				
		PAC	HAV	MLK	MAL	F&H
Aluminum Cans	cans w/o other scrap	√ (all)	√	√	√	
Batteries	car batteries		√			
Corrugated Cardboard	cardboard		√		√	√
Newspaper	separate from other paper	√ (H)	√	√	√	
Office Paper	ledger, computer paper	√ (H)	√		√	
Glass	glass		√			
Magazines	magazines	√ (L)	√		√	
Non-Ferrous Metal	copper, brass, aluminum	√ (all)				
Plastic	#1 pet and milk jugs		√		√	
Radiators	Radiators	√ (all)	√			
Scrap Iron	Scrap iron and steel	√ (all)				
Vehicles	Scrap vehicles	√ (H)				
White Goods	Used appliances (no CFCs)	√ (H,G)				

Recyclers Listed on Table 11:
PAC – Pacific Steel & Recycling (Havre, Glascow, Lewistown)
HAV – Havre Day Activities & Recycling, 235 First Street West, Havre
MLK – Milk River, Inc., 219 2nd Avenue South, Glascow
MAL – Malta Opportunities, Inc., drop-offs at 11 S 3rd E and next to City Hall, Malta
F&H – F&H Recycling, drop-off behind police station, Lewistown

Billings and Great Falls have recyclers for old phone books and steel "tin" cans. Used oil is accepted at Superior Muffler and Heltne Oil Company (both in Havre) and the Glscow landfill.

There is no current market for used tires in Montana.

Yard waste is managed at the municipal solid waste (Montana Class II) landfills in North-Central Montana. Currently, there are no composting operations near Fort Belknap.

5.1.2 Demographics In Relation To Recycling

In reviewing the locations of resources and marketability of recyclable items, the following FBIC attributes must be considered:

- Low Total Population – Small communities generate low volumes of waste causing the unit price of waste management to be relatively high.

- Seasonal Effects – The level of solid waste and recyclables fluctuates over the course of the year.

- Low Housing Density – The unit cost of curbside collection service is directly proportional to the distance between residences so a drop off program will likely be the most cost effective.

- Small Industrial Base – The solid waste composition for the industrial/commercial sector is different than that of residential solid waste. The driving force for collecting certain commodities will be through participation of the Tribal government, cultural, educational, recreational and commercial facilities in a recycling program.

- Limited Program Staffing – Tribal communities may have fewer professional solid waste management staff employed within Tribal government.

- Recycling Markets – Transportation costs are directly proportional to the distance to the market. Rural communities are geographically isolated from markets and will experience relatively high transportation costs.

The demographics of Tribal communities do not suggest that recycling would not work but a customized program may be needed. A systematic approach, labor and equipment resources sharing, and volunteer participation each contribute to success of the recycling program. The Headwaters Recycling Cooperative, headquartered in Boulder, is a good example of a successful rural recycling program in Montana.

5.1.3 Market Analysis

The end goal of any recycling program is to provide materials to a manufacturer who will use them to produce a product. Providing recyclable materials to a broker who ultimately provides them to a manufacturer is an exercise in marketing. An overview of past practices of recycling shows that there are certain marketing challenges. These are market availability, cost of collection, market price, public participation, and public education. To overcome these challenges a marketing plan must be developed that identifies:

- Current Marketing Situation – Presents relevant background data on the markets, products that can be accepted, competition, distribution, and future market projections.

- Issues Analysis – Identification of opportunities, strengths and weakness and issues facing products.

- Objectives – Defines the goals of the plans, areas of volume and profits/losses.

- Marketing Strategies – A broad marketing approach used to meet the objectives.

- Action Programs – What must be done? Who will do it? When will it be done and what are the costs?

- Controls – How will the plan will be monitored and who will have the authority to make changes?

5.1.4 Recycling Opportunities and Collection Systems

Collection alternatives described in the following sections need to be considered prior to the FBIC's involvement in a recycling program.

Drop-Off Centers

Drop-off recycling centers provide a place where residents can bring materials to be recycled. This is the most common type of recycling option because of low-cost construction, low-maintenance, and flexibility to meet the individual needs of the community through design. They can be coordinated with transfer stations, roll-off sites, or set up in satellite drop-off centers such as parking lots or other container sites. One challenge is the potential for contamination when the sites are not staffed or attended. Also, the pickup of containers from remote sites can add costs that offset the value of the recycling effort. Another issue is the number of centers needed to service the Tribal populations. The European recycling experience has indicated that "one drop-off site for every 2,000 participants" is efficient. Unfortunately, with a low population base, drop-off sites may need to be located where typical waste disposal is currently occurring. Parking lots at locations regularly traveled to such as shopping malls, grocery stores, government buildings, schoolyards, post offices, or libraries are also suitable.

Keeping sites neat and free of refuse is imperative, especially if containers are placed in highly visible areas. Clearly marking containers and proportioning receptacles is key to maintaining a clean site. A systematic inspection program should be developed. This would aid in the pickup of full containers and in removing contaminants that promote illegal disposal. Also, providing a container for the bags in which the recyclables are brought to the center adds to the minimization of littering. A staff person could be assigned to monitor all sites or volunteer groups can be recruited to adopt a site.

A rent free, paved surface, high traffic area with good accessibility, high visibility, clean and free of debris, with enough space to handle traffic without impeding on local trade, is an ideal location. A major factor of concern is that these locations not become a dumping ground for all types of waste. The FBIC may require a monitoring schedule to assure proper pick-up and maintenance. Tribal commercial generators could participate and add to volume, thus making the program more successful. Potential sites may include:

- Existing roll-off transfer sites.

- Schools and government buildings that are found on frequently traveled routes. Government buildings are high-impact waste generators with much of the waste stream in the form of recyclable paper products.

Containers for Recycling

Facility containers should be designed to meet the specific needs of the community. Some considerations may include trailers that are segregated for different commodities, or containers that have type-specific access allowing for disposal, such as a circular hole for cans or bottles, etc. Choosing the appropriate container is an important aspect of the design and success of the project.

Igloo Type Recycling Containers

This type of container is currently being utilized by the Headwater's Recycling Cooperative. Its features include a dome-like configuration, fiberglass construction, bright colors and a small opening for depositing materials. They are popular because they can be easily moved (to be utilized at a powwow, for example) and smaller in size, which aids in placement. They may be located along sidewalks, in parks, or on parking lots. The igloos have a pleasing appearance. They vary in size and require less space than larger site containers such as roll-offs.

The igloos are collected using specialized vehicles with hydraulic booms and dump bodies. The vehicle can drive next to the container and a hook/hoist mechanism lifts the container over the bed or trailer of the vehicle. A cable pulls a lever that opens the bottom of the container and empties the material into the trailer.

New containers cost between $500 and $900 per container. In Montana, communities have purchased them for as low as $200. A new collection truck can cost between $50,000 and $100,000. The FBIC may have an existing vehicle which can be retrofitted with the specialized crane or a contractor with a semi can be leased for collection. Retrofitted logging trucks have also been used.

Roll-Off Type Recycling Containers

These containers come in many configurations to meet a variety of needs. The roll-off containers are segmented and may be top-loading or side-loading. Traditional sizes range from 15 to 40 cubic yards. Roll-off containers are covered so they protect materials from damage from the elements. They range in cost from $4,000 to $7,500 and are very useful for large materials such as cardboard. Most commonly used for recycling are the 15 to 18 cubic yard containers, which measure 15' x 8' x 4'. When planning a drop-off center using this type of container, about three times more space will be needed for collection. To unload/load without the use of a second vehicle, the operator will have to drop off an empty container; pull forward for the length of the box to release it, and then reverse this operation to pick up the full container.

Standard Front Load Containers

Some recyling locations could be serviced by standard front-load bins, with locking tops and inserts. These types of bins are modified to encourage recycling and prevent pilferage.

Buy Back Centers

A buy back center requires residents to separate and deliver materials to specific locations during scheduled times. A notable difference to drop off centers is that the persons participating receive money for their recyclables. Because of this incentive, people may travel further to a buy back center than to a drop off center.

A realistic evaluation of this type of program should be addressed. Equipment cost, marketing, rent, operations and labor costs are contributing factors. The fluctuation of markets may create negative cash flow should markets take a major turn and commodities are not sold on a timely basis. Theses centers require several employees and may require sorting tables, conveyers, bailers, shredders and forklifts. In addition to scales and storage containers, a suitable site would be needed to operate such a facility. In conclusion, establishing buy back centers is more costly than drop off centers. The use of free land, donated equipment and cash reserves for material purchase is often needed to sustain a buy back center.

Curbside Collections

Residents Separating Materials

Requesting residents to separate materials is one method of curbside collections. If households were willing to participate, they would need two or more containers for this program: for example, three containers would be needed if the collections included glass; aluminum cans and tin; and newspaper and cardboard. Storage may be an issue because space can sometimes be limited, particularly for users that do not have a garage or basement. Purchasing or providing the containers can also be limiting due to economic constraints. Paper or plastic bags can be used as an alternative means of storage but this can become an issue for those handling the products and blowing litter may become a problem.

This type of program requires the residents to commit to sorting and storage prior to collection. An aggressive education campaign would need to be developed and marketed. Also with a curbside program, a central area would need to be procured and staffed to manage materials and prepare the recyclables for market.

This type of program offers the greatest convenience to the residents but is the most labor intensive and expensive type of recycling program. To be successful, it would have to be implemented community-wide so the cost would be distributed among many users.

Commingled Materials Sorted by the Collector

This type of curbside recycling program is the same as listed above but all recyclables are placed in one container. The same advantages and disadvantages apply but sorting costs will be greater as the material would be completely handled at a processing site, which is labor intensive.

Combined Recycling and Refuse Collection

This process integrates collection of both the refuse container collection with the recycling. It is very costly to have recycling vehicles drive past households that are already being serviced by refuse collection vehicles. To avoid duplication of services, a special trailer for recyclables can be pulled behind the refuse truck. Another method is to have separate bags that are commingled in with the refuse and are pulled out at the time of disposal from the regular packer truck (co-collection). These bags are of a different color easily seen by staff which can then be hand picked out. They must be of heavy gauge weight and should be a bright color.

Some drawbacks are that the bags can be torn and recyclables become part of the waste. Glass can also break and contaminate the entire bag.

Apartment, Dormitory or Elder Housing Recycling

Most apartments or housing complexes maintain a central area for collecting refuse. Making recycling containers available to the residents at these sites increases usage and should be considered when designing a curbside or drop off collection program. Some modifications may be needed to existing collection areas and an education program is needed.

Commercial Collection

With commercial waste streams that typically contain clean waste (except decomposable food processing wastes from restaurants and grocery stores), much of the waste is recyclable. A commercial waste stream analysis would be needed (i.e., waste sorts) prior to implementing this project. Incentives can be offered to those businesses or Tribal government buildings that would compensate for the necessary waste sorting. Hospitals are usually not participants due to the potential for biohazard contamination, where workers who deal with the recyclables may come into contact with blood born pathogens.

Cardboard and Office Paper Collection

A significant portion of commercial waste is cardboard and paper. By structuring collection routes, haulers could collect loads that were only cardboard and paper. Cardboard usually has a high market value whereas paper waste is less predictable. In office situations, high-grade paper waste can be collected at desk sites and copy machine areas. Centrally located collection containers are a must with janitorial crews who empty into large appropriately labeled containers. Buyers of recovered office paper require large supplies to receive the maximum financial return. A large staging and storage area is needed for this type of program.

Financial Incentives

If businesses or residents are offered recycling collection that is cheaper than regular tipping or disposal, they are more likely to recycle.

Another option would be to adopt a policy where no loads including cardboard (for example) are accepted. This restriction forces the resident or business to develop a system to reduce or recycle this type of commodity that is being disposed of.

Tribal Government Collection Systems

To be successful in implementing a recycling system in Tribal government offices, an aggressive education program would be needed for staff generating the waste and those who are collecting and disposing of the wastes. End markets must be secured for the recycled products.

Yard Waste Collection Systems

Yard waste consists of leaves, grass clippings, and brush from household lawn care and commercial landscapers. Much of this waste can be mulched or composted at a central location or on site. These end products can be used by the facility or offered for sale to the public.

Brush is considered tree trimmings, pruned branches, and woody yard waste. One way to collect brush from residents would be to establish regular collection days where a portable chipper could be utilized. The length of time between collections may be an issue if routes and times are not convenient to disposal. Another alternative is to establish drop off centers during the months from April to October.

Christmas Trees

This waste stream is seasonal for a two- to four-week period. Regularly scheduled collection would allow for these items to be removed from the waste stream. Residents could be notified of collection dates, and instructed to remove ornaments, etc. from the trees. Both packer trucks and dump trucks may be mobilized to collect the trees and dispose at a central drop-off location. Residents could also self-haul to the location. Christmas trees are generally mulched.

Composting

Backyard Composting

A backyard composting program can be implemented through an educational program to residents. These projects can be started using kitchen wastes and yard wastes. Examples of such materials are grass clippings, egg shells, coffee grounds, etc. It is estimated that a residential backyard composting program may reduce wastes up to 15%. This program can be simple or more elaborate. Commercial receptacles can be purchased for about $15 -$30 per household. Other low-tech programs involve using large garbage cans, barrels or wooden boxes with the bottom knocked out. The compost should be placed in a shaded area to reduce the moisture evaporation, and where yard and household waste may be easily added. The pile will need water added periodically and should be turned with a pitchfork. Meat, bones and fatty foods such as oils or cheese should not be used in the compost as it can attract pests.

Commercial or High End Composting

Composting on a large volume or scale requires a high volume of bulky wastes such as leaves, yard rakings, and in some instances, septic tank sludge. This high end product and volume requires additional planning and consideration for a quality end use product. Some of those considerations are site options, equipment and marketing of the finished product.

The product quality will dictate the amount of technology needed for processing. The product must be accepted as having a beneficial use within the community of those purchasing the product. Compost end users are generally looking for a product that is rich in organic matter and nutrition, is uniform in appearance and is free of odors or foreign matter (bags or weed seeds). Some producers have their product tested to accurately label a quality assured product.

Market Options

The ability to market the end product will be determined by the product volume, quality and the community demand. Some market end users could be growers (nursery), landscapers (golf courses), land reclamation (closed landfills), and public/Tribal agencies (highway projects, etc). A detailed market analysis could be compiled to target other potential users in the area.

Major Appliances (White Goods)

White goods include appliances such as washers, dryers, stoves, and refrigerators. Recyclers of these materials handle a variety of products and ultimately these are recycled into new products. The most cost effective means for recycling these types of materials is to have a central drop-off location. Generally a local contractor will come with processing equipment and will bundle or bale for transport. This type of operation requires a large staging and collection area that is well monitored to keep municipal waste from contaminating the site. Processing the products is often contracted because equipment capital costs require an immense volume of recyclables to sustain income. White goods can be recycled in north-central Montana. Appliances are accepted without charge at the Hill County Unified Disposal Facility.

One issue in collection of appliances is where chlorofluorocarbons (CFCs) are present and require special handing. CFCs (e.g., Freon) are found in refrigerators, freezers and air conditioners as the cooling agent. They are also present in vehicle air conditioning units. The open venting of this material is strictly prohibited and only trained staff may recover these materials for recycling.

Junk Vehicles

Junk vehicles may have a market value for used parts, or can be managed as scrap iron and recycled. Petroleum fuels, oils, lubricants, coolants, CFCs and other potentially hazardous substances must be removed prior to recycling.

Tires

Tire disposal can become a complex issue. Landfills often charge a special fee for the collection and handling of waste tires. Tires are often stockpiled or disposed of in illegal dumps. These dumps become a health and safety issue and promote disease vectors. Tires in illegal dumpsites may catch fire and burn uncontrolled for some time.

Separate collection for tires from commercial establishments to a centralized location or a private processing facility is one option. Public education and participation are critical and alternative markets may be sought.

Reuse or Donate

There are many non-profit organizations that reuse materials such as Goodwill, the Salvation Army and others. These organizations receive donations and sell the materials at a reduced cost.

Other items to reuse may include magazines or books which can be given to friends, donated to hospitals or homes for the elders, or doctors' offices. Yarn, cloth, buttons, wall paper, egg cartons, and clean food containers can be used by nursery or primary grade school or day care centers.

Eyeglasses may be donated to local Lion's clubs. Using rechargeable batteries instead of traditional batteries is another great way to reuse a product.

For commercial or industrial businesses, the concept of reuse may be in the form of backhauling. This is where the vehicle making a shipment takes materials designed for recycling back to the manufacturer instead of returning empty. Also companies can request vendors to ship products in packaging designed for recycling or in recycled content packages.

Buy Recycled Program

This type of program promotes the consumer to purchase products made of recycled content. The term recycled products means that the product is made in whole or in part of a post consumer waste. Under Section 6002 of the Resource Conservation and Recovery Act (RCRA), the USEPA issued procurement guidelines to assist the government in buying recycled products. The guidelines are published for paper and paper products, rerefined lubricating oil, retreaded tires, building insulation, and cement and concrete using fly ash. Each agency using federal funds and their contracts must establish affirmative procurement and promotion programs.

Tribal governments who purchase everything from office paper to construction materials can set an example for their members under this program. For the FBIC to consider a formal buy-recycled program there are key elements to consider:

- Review specifications – Tribal purchasing officials can review product and service specifications to identify and eliminate any provisions that REQUIRE the use of virgin materials or that exclude the use of recycled products.

- Establish Content Standards – Many Tribal agencies have established minimum recycled content that apply to their own purchases of certain goods and materials.

- Preferences to Recycled Products – Although some recycled products may be more expensive (5-10% higher) than those that are not of recycled content, the Tribes may consider preferences for these products.

- Protocol – Require printers and contractors to submit bids, proposals and reports on recycled paper, with vegetable based inks, printed on both sides with removable bindings and staples.

5.1.5 Market Development for Recyclables

It is imperative that end markets are predeveloped before the collection of materials. Markets dictate what types and materials can be collected economically so programs must be designed to meet market specifications.

There are two types of markets: intermediate, which include processors and brokers, and final markets. The volumes of recyclables collected and areas available to process the commodities will dictate the market share. Intermediate markets take the raw materials and remove the contaminants, sort, process, bale, and ship the materials to final markets. The final markets manufacture products directly from the recovered materials. They require the generator to provide a quality material to meet their manufacturing specifications.

The Institute for Scrap Recycling Industries prepares standard scrap specifications to assist in selling materials. A market analysis would need to be accomplished to characterize the baseline for recycled materials and the potential new product manufacturers.

Education and Community Involvement

Education and community involvement will assist in developing markets for recyclables, inform Tribal leaders, the public, and educate businesses about the benefits of creating local end uses. Information may also be distributed through general or council meetings, economic development studies or planning efforts, and community and school gatherings.

Define the Market Development Area

The supply of recovered materials will be influenced by population density, economic conditions, quality of the materials recycled and the distance to end markets. The market analysis may be done by conducting waste sorts. Data on amounts (volumes) and types of recovered wastes is critical. Estimates may be obtained by surveying local resources and communities with similar population densities and economic characteristics.

Surveying local businesses and industries will also need to be accomplished. These waste generators could hold the potential for a larger share of market development and sustainability of a recycling program. After identifying the market, a contract could be secured to set terms and conditions. This contract should define what and how materials will be accepted and how they will be delivered to the facility for processing or end use.

5.2 Education and Community Involvement

Public outreach will develop a community awareness of the health hazards resulting from improper disposal of solid waste and provide education on viable alternatives and regulatory requirements.

The methods of waste disposal practiced by our grandparents are no longer adequate for many of the items we use in and around the home today. Safe disposal requires developing new methods and implementing new technology. However, before these changes can be effective, the community members need to know not only why these changes are essential to preserve healthy

living conditions, but also how to better protect the lands, waters, and air.

Changing old beliefs, behaviors, and habits is not easy. Human nature resists change especially when mandated—when the old habits seem to be working—when reasons for change are not widely or well known, and in particular, when the change will cost money, money people simply don't have to spare. Recycling, composting, or other waste minimization programs must include incentives or residents may not implement them.

To facilitate change it is essential to develop an educational program for all Tribal members that include the following:

1) Reasons for change – Health hazards associated with household and hazardous waste;
2) Reasonable alternatives – Waste reduction, recycling, and sanitary methods for waste disposal.

The Community education program would be developed with key FBIC members representing all verbal age groups and subsequently presented to all residents.

6.0 GOALS AND RECOMMENDATIONS

This section establishes goals for solid waste management and provides recommendations for the actions necessary to meet those goals.

6.1 Solid Waste Management Goals and Recommendations

Solid waste management goals and recommendations, future management practices, and dumpsite cleanups are addressed in the following sections.

6.1.1 Recommended Transfer and Haul Alternative

It is recommended that Transfer and Haul Alternative B (Modify Existing System) is implemented. This alternative is described in Section 4.3 and detailed costs are found in Appendix A.

The assumptions listed in Section 4.3 were used establish a basis of comparison while holding certain variables constant. The actual cost of implementing the recommended alternative can be reduced by any of the following actions:

- repair existing equipment (i.e., old compactor truck)
- purchase quality used equipment and perform scheduled maintenance
- utilize a baler or compactor for cardboard wastes

The short-term annual operating cost of implementing Alternative B is expected to be similar to the current annual operating cost (refer to Appendix A). However, the benefits of this alternative are:

- Minimal hauls to the landfill (as fuel costs continue to rise)
- Cleaner, safer solid waste transfer sites
- Reduced health risks and FBIC liability
- Waste segregation, setting the stage for implementing a recycling program
- Local employment (site monitors)

There is always uncertainty regarding future operating costs. The current trend suggests that certain costs (e.g., fuel) will continue to rise. Generally, practices that reduce waste volume or the amount of waste to be hauled will save money.

6.1.2 Future Solid Waste Management

Future solid waste management on the Fort Belknap Indian Reservation will consist of improvements to the existing system, following the recommendations described in Section 6.1.3 of this plan. Prairie Mountain Utilities will implement the changes, under the direction of the FBIC Council.

6.1.3 Dumpsite Cleanups

Old dumpsites should continue to be cleaned up, reclaimed, and revegetated to discourage further use and eliminate potential health, safety, and environmental concerns. Removal of solid waste other than cars and appliances may be accomplished by the lowest bidder, provided that the services are adequate. When the cleanup is completed, signs should be installed to help prevent further dumping and to warn visitors of physical or health hazards that may still be present. Signs should be posted in public locations announcing the closure of the site.

Once cleanup of the open dumpsites begins, progress shall be monitored to assure that agreements under the contract are being met. The monitoring party may include FBIC Environmental Department personnel, members of the FBIC Council not involved in the actual cleanup, or another outside party. It is recommended that Tribal officials be involved in the monitoring and final review of any cleanup.

6.1.4 Recommended Waste Minimization Approach

Immediate implementation of a comprehensive waste minimization program is not realistic, but goals for both short-term and long-term planning can be set. The following activities are recommended short-term solutions:

- Appoint a Tribal member to manage the waste minimization program;
- Conduct waste surveys and quantify the recoverable materials;
- Complete a market analysis and determine what materials will be managed;
- Establish convenient drop-off centers for recyclables (e.g., igloo containers);
- Advertise and educate people on recycling locations and the acceptable materials; and
- Coordinate the use of shared equipment (e.g., wood chipper) or other resources among individuals, housing complexes, and Tribal offices or programs.

Implementing a annual trash sort or waste audit is important to set a baseline and determine a

more accurate range of waste generated. This will help identify target waste materials for reduction and help quantify annual changes. The market survey should include determination of transportation costs and the location of markets for the different waste materials.

Long-term waste minimization planning could include targeting specific goals. One example would be achieving a 30% (relative to the total generation) waste stream reduction over a 10-year period, which would match the national average waste stream reduction in 2000.

6.2 Tribal Policy

Currently the FBIC has no waste minimization policy in place. This type of policy usually strives toward a percentage of waste diversion such as 5% to 25%. The 20-year waste estimates for the FBIC are based on an annual generation rate of 4,138 tons. A 5% waste minimization goal would divert 207 tons of waste; a 25% goal would divert 1,035 tons of waste from landfill disposal. A recycling policy could be developed ensuring proper disposal of recyclables that would also limit or reduce the amounts of solid waste generated by implementing source reduction and providing financial incentives.

It is recommended that the *Solid Waste Management Code of the Fort Belknap Indian Reservation* should be reviewed annually and amended as necessary to meet changing needs and conditions. It is recommended that the following changes should be considered for current changes/updates to the code:

- Include by reference, the current federal solid waste requirements (e.g. 40 CFR 258)
- Modify Section 203 to control access and regulate the operating practices of solid waste transfer sites, to eliminate waste accumulation and other health hazards
- Require the solid waste management system to be financially self-sustaining and prescribe sanctions for those who will not pay (while maintaining service for those meeting certain financial need criteria)
- Notices of violation could be issued by Tribal Law Enforcement personnel; the code currently places sole responsibility for such actions on the Director

6.3 Public Education

An educational program reaching all FBIC residents is recommended. The program should include information and recommendations regarding:

- Health hazards associated with household and hazardous waste;
- Waste reduction, composting, and recycling; and
- Sanitary methods for waste disposal.

As the FBIC's integrated solid waste management plan evolves, it is recommended that FBIC residents are informed and provided an opportunity to comment on any proposed changes. It is important that any changes in rates or fees for solid waste collection and disposal should be explained to the community residents.

7.0 PLAN IMPLEMENTATION, FUNDING, AND APPROVAL

This section discusses the schedule for implementation of the solid waste management plan, lists potential funding sources, and shows the FBIC Tribal Council's commitment to implementing the FBIC Integrated Solid Waste Management Plan.

7.1 Schedule for Implementation

This solid waste management plan is effective upon FBIC Council approval. The schedule for implementation will be developed by the FBIC Council and will meet the requirements of the RCRA 7003 Administrative Order to FBIC and Prairie Mountain Utilities (summarized in Appendix A), as negotiated between the FBIC and EPA.

7.2 Financial Stability and General Funding Sources

The current solid waste management system under the Utilities offers greater financial stability than past operating practices. In most cases, monthly utility billings include water (and/or sewer) service, so failure to pay the utility (solid waste) bill can result in a temporary loss in service. There is less incentive to pay solid waste fees by those in outlying areas (outside community water and sewer systems). Suspending solid waste services in outlying areas would likely result in illegal dumping and eventual, and possibly even greater, cleanup costs.

It is imperative to have a proficient solid waste management program that is adequately funded to promote the various activities. Funding sources for solid waste alternatives and site clean-ups are limited and frequently competitive. Broad based financial resources include those listed in Table 12. Additional resources could include:

- Industrial Development Bonds
- Revolving Loan Funds
- Partnerships with existing industries

TABLE 12. POTENTIAL FUNDING SOURCES

Source	Offerings
Bureau of Indian Affairs	Very limited resources. May be able to provide some assistance with obtaining equipment. Have some funds for economic development.
Council of Energy Resources for Tribes	This organization has access to a variety of funding sources and can provide consulting on strategic and economic development planning.
Department of Defense	Beyond monies for damages suffered as result of military activity, disestablished military bases may have usable equipment.
Department of Energy	Indian Energy Program Grant. Annual solicitation. Competitive. Projects need to demonstrate energy conservation/energy development capability.
Department of Housing and Urban Development	The Community Development Block Grant can be used for construction of solid waste facilities, equipment used at solid waste site, and clean-up. Cannot be used to buy rolling stock used off-site such as waste collection vehicles. Annual solicitation process. Competitive. HUD also provides assistance under the Native American Housing and Self Determination Act (NAHASDA), whereby housing authorities can pay utility fees for low rent units.
FBIC General Funds	Limited resources with many competing needs.
Indian Health Service	Very limited resources. Tribe needs to work with IHS in defining project ranking. IHS traditionally gives water and sewage a higher priority, however this source should not be overlooked.
Small Business Administration	Loans for economic development. Small amount of grant money occasionally available for special projects and demonstrated needs.
State of Montana	Treasure State Endowment Program. For community infrastructure improvements, including solid waste. Competitive.
Tribal Solid Waste Interagency Workgroup	Annual open dump cleanup grants. Used to characterize/assess open dumpsites, develop alternative solid waste management activities/facilities, and cleanup and close open dumpsites. Competitive.
USDA Rural Development	Grant and loan resources. Can be used to develop solid waste management systems. Annual Tribal set-aside.
U. S. Environmental Protection Agency	- *General Assistance Grants*: Annual solicitation process. Solid waste planning and implementation. - *Jobs through Recycling Grants:* Annual solicitation process. Can be used to implement a recycling program that provides an added value to recyclable materials. Competitive. - *Experimental Projects Grants*: Must be innovative and test new technology. - *Environmental Justice Grants*: Annual solicitation process. Competitive. - *Brownfields Tribal Response Program:* Grant monies can be used to inventory, assess and cleanup open dumpsites, develop codes and ordinances, and develop oversight and enforcement capabilities.

7.3 Recycling Program Funding Sources

Potential funding and information sources for recycling programs are listed below.

- Administration for Native Americans
  (202) 690-7776
  Provides competitive grants to support social and economic development projects.

- Bureau of Indian Affairs
  (202) 208-5326
  Economic Development Office provides grants, loans and small business development.

- Buy Recycled Business Alliance
  (202) 625-6406
  A service of the National Recycling Coalition; provides technical assistance and peer counseling on buying recycled at no cost.

- Composting Council
  (703) 739-2401
  A national association that promotes composting and that serves as an information clearinghouse. They can provide information on setting up community composting programs.

- Cooperative Marketing Network
  (402) 444-4188
  The network can provides regional cooperative marketing associations. They publish a free newsletter with information on the cooperative marketing of recyclables.

- Foundations
  The Foundation Center (212) 620-4230 provides free access to foundation directories that are privates who promote community development projects.

- Indian Health Service
  Local IHS offices can provide technical assistance in setting up recycling programs.

- Keep America Beautiful
  (203) 323-8987
  This national nonprofit organization has extensive recycling educational materials.

- National Recycling Coalition
  (202) 625-6406
  This nonprofit alliance is comprised of recycling organizations that provide technical education and assist in increasing public awareness.

- National Development Council
  (212) 682-1106
  A private nonprofit corporation that assists small businesses in packaging loan applications.

- RecycleLine
  (800) 233-9923
  A national online database providing information on recycled products. (There is a charge for this service and rates vary).

- Rural Development Administration/Farmers Home Administration
  Administers three programs for low income communities that may assist in setting up collection programs or a recycling enterprise:
  - Community Facilities Program (202) 720-1500
  - Rural Business Enterprise Grant Program (202) 720-1500
  - Business and Industry Guaranteed Loan Program (202) 690-4100

- Small Business Administration
  (800) 827-5722
  SBA offers business development assistance and guarantees small business loans from private lenders.

- U.S. Department of Housing and Urban Development
  (202) 708-1422
  HUD's Indian Program administers a Community Development Block Grant Program, which provides funds for community infrastructure projects.

- U.S. Environmental Protection Agency
  (406) 457-5018
  Environmental Grants can be used to set up recycling programs and educational materials for use in the community.

7.4 Tribal Council Approval

After reviewing the options set forth herein, the Fort Belknap Community Council agrees with the recommended alternative, as revised. Alternative B will be implemented over a 5-year period. This plan is hereby approved and accepted this date by the Fort Belknap Community Council of the Gros Ventre and Assiniboine Tribes of the Fort Belknap Indian Reservation.

Date: _____

Signature:

_____ _____

Julia Doney, President
Fort Belknap Community Council

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